Open Systems Architecture for Legacy Aircraft (OSALA)

Open Systems Project Engineering Conference (OSPEC)

FY 98 Status Review - Executive Summary

29 April - 1 May 1998

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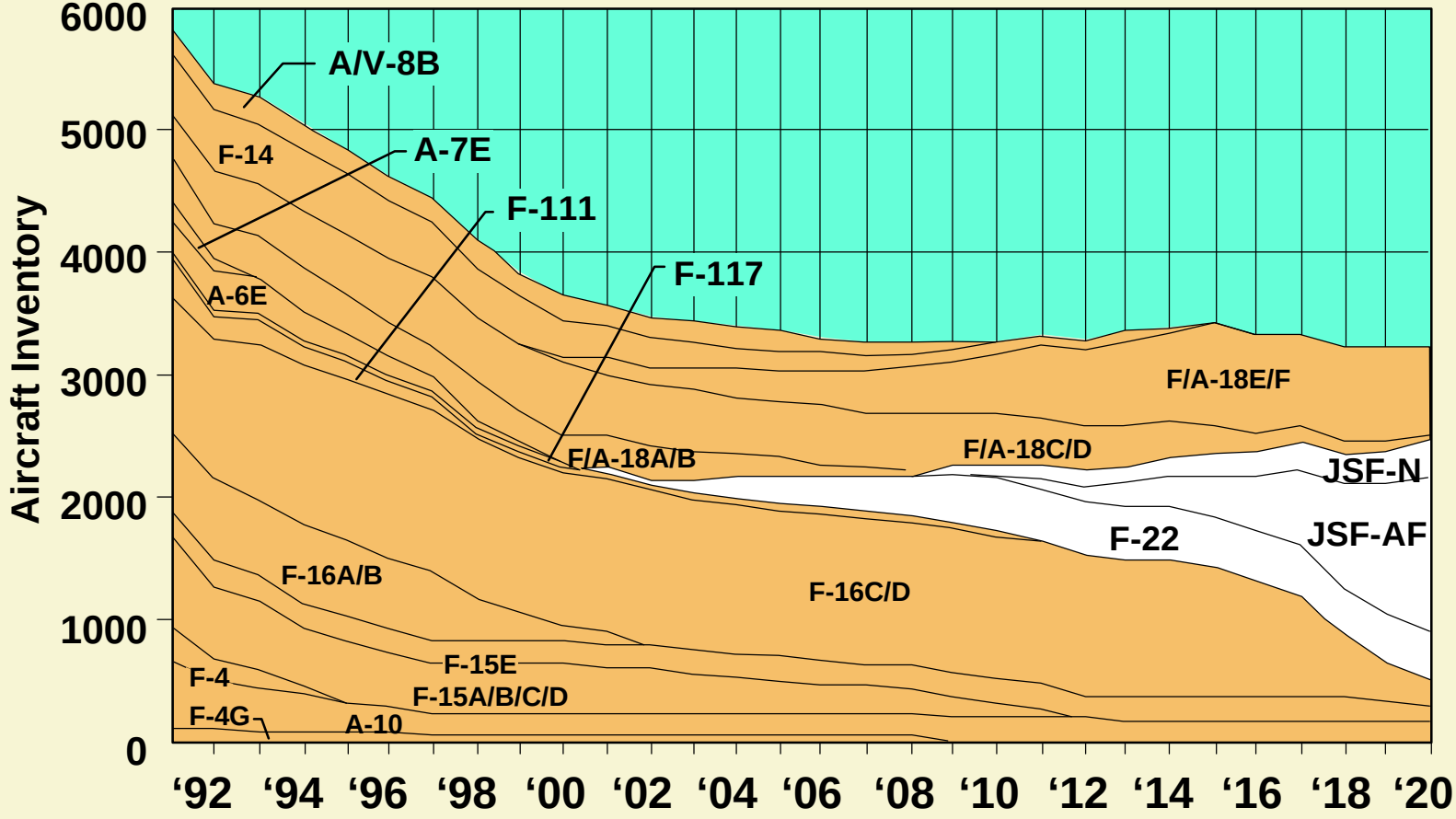
The Majority of Our Tactical Force Through 2020 Will Be Legacy Aircraft



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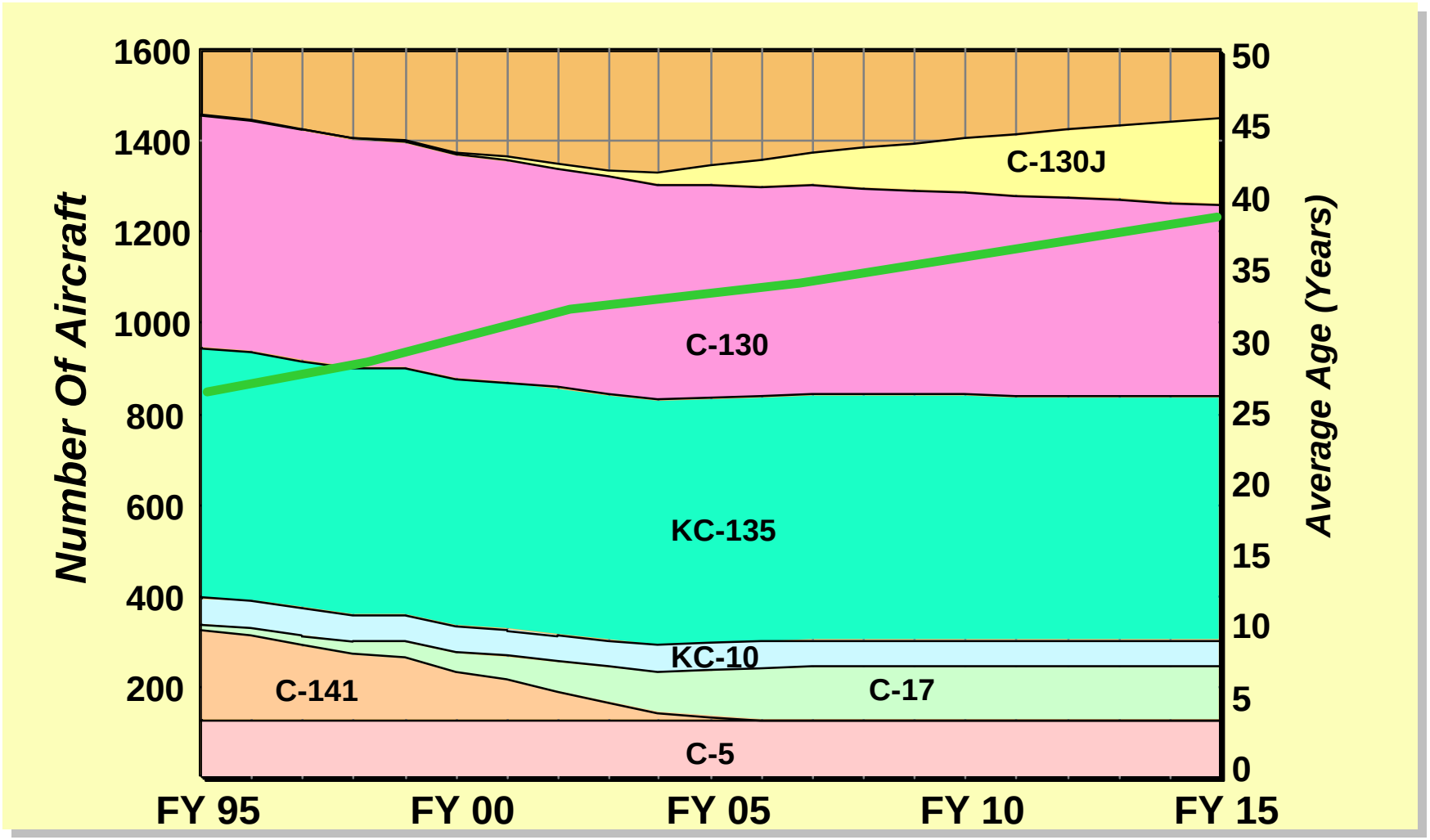
Strategic & Tactical Airlift Inventory Projections



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Avionics Upgrade Environment

- **The User Must Accomplish More With His Fleet of Existing Aircraft**
  - **Limited Funds and Aging Fleet (Average Age of All Fighters 18yrs @ 2010)**
- **Modifications Must be Incremental, Modular, and Rapid**
  - **Available Funding Profiles Will Not Allow Major Physical Upgrades**
  - **Politics are the Enemy of Long Programs**
- **We Must Work Within the Aircraft Physical Architecture (Wiring, Cooling, etc.)**
  - **Physical Changes Drive Mod Cost Exponential (Kills Program)**
- **No Software Modification is Minor**
  - **Test and Validation are the Cost Drivers (Not Design and Coding)**
- **Logistics Tail Plays Key Role in Upgrade/Mod Decisions (Have Final Vote)**
  - **The Cost Here Continues Throughout the Life Cycle (Key Words - 1 Level Maintenance)**
- **Commercial Market Drives the Electronics Industry (Not DoD)**
  - **We Must Work Within This Environment for Affordability**
  - **Key Element is Rapid Commercial Parts Obsolescence (Not Environmental)**
- **We Must Work Within the Avionics Vendor Chain of Capability**
  - **Vendors Must Protect Their Ownership of Functionality (i.e. CNI, EW, Radar, etc.)**
  - **DoD and Primes Must Prevent "Vendor Vanish"**

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Open System Studies

Studies Were Directed Towards Legacy Avionics Architecture…

Studies and Analyses	Summary of Preliminary Results
Global Reach Open Network	Aircraft Weapon Systems and Support Systems Should Be Directly to the Military Networks for Ground Operations Repair, Maintenance, and Support
Common Real Time Operating System Interface for Software	Commercial Real-Time Operating Systems Have Been and Can Be Adapted
Open Network Architecture Protocols	Asynchronous Transfer Mode and Fibre Channel Are Interim Network Solutions (Integrated Sensor System Program to Determine Radar Protocols)
Open Standards and Interface	Commercial Open Standards Are Available to Replace Existing LRUs

…to Evolve Aircraft Weapons Systems to Open Systems Standards.

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Conclusions and Recommendations

- **The Big Pay-off Is in Opening the Federated Architecture**
- **DoD Investments Are Required**
  - **Open Standard for Mil-Std-1553 Emulation on COTS Network**
  - **Open Interface Standard for Peer-to-Peer Military Protocols**
  - **Validation and Flight Test**
- **The Driving Cost Factors Are Group A Aircraft Changes and the Software Impacts to Existing Avionics**
  - **Must Address How to Minimize These Costs for Each Aircraft**
  - **Configuration**
  - **Develop an Upgrade Plan for Modernization**